Tri-Service Cost Engineering Workshop and Conference: Chicago, Il

HTRW CX:

Richard Stricker

July 2007

- 33 years with USACE
- 23 years as a Cost Engineer
- 1 year + with the CX
- Certified Cost Consultant

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HTRW CX Points of Contact

ENVIRONMENTAL ENGINEERING & GEOLOGY BRANCH (CENWO-HX-E)

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COST ENGINEERS

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- Kate Peterson **Phone: (402) 697-2610 E-Mail: Katherine.M.Peterson@nwd02.usace.ary.mil**
- Rich Stricker **Phone: (402) 697-2575 E-Mail: Richard.A.Stricker@nwd02.usace.ary.mil**
- Terry Tomasek **Phone: (402) 697-2590 E-Mail:**

HTRW CX (Center of Expertise)

Mission and Vision

Web: http://www.environmental.usace.army.mil/

The USACE environmental mission encompasses the restoration, management, and enhancement of local and regional ecosystems. This broad mission includes the restoration of sites contaminated with hazardous, toxic and radioactive substances. The HTRW Center of Expertise (CX) has played a vital supporting role in the identification and cleanup of contaminated defense and commercial sites throughout the Nation.

SUBJECT MATTER

- CX: Involvement in Environmental Cost Engineering Committee (EC2)
- HTRW PROJECT EXAMPLES

CX: EC2 INVOLVEMENT

Environmental Cost Engineering Committee (EC2) Web:http://www.frtr.gov/ec2/index.htm

MISSION:

To provide agency leadership in promotion of sound cost estimating practices and techniques, and to leverage individual cost engineering tools and development efforts.

OBJECTIVES:

- Provide cooperative leadership to promote advanced cost estimating and cost data collection tools, lessons learned, and information exchange.
- Disseminate cost engineering information pertaining to environmental projects.
- Provide training for environmental project/program managers in application of cost estimating and cost

Ec2 Pertinent Information

- Membership is open to Federal Agencies with interest and stake in Environmental Cost Engineering issues.
- (FRTR) Federal Remediation Technology Roundtable, Established in 1990 and meets twice/year to build collaboration with federal agencies involved in HTRW cleanup.
- (Ec2) Environmental Cost Engineering Committee joined forces with FRTR in 1999.
- Meetings are held every other month at the EPA HQ in Crystal City, Va. or by conference call.
- POC: Bryan Skokan DOE

  Phone: (301) 903-7612

  E-Mail: Bryan.Skokan@em.doe.gov

PARTICIPATING MEMEBERS

- U.S Department of Defense
- U.S. Environmental Protection Agency
- U.S. Department of Energy
- U.S. Department of the Interior
- National Aeronautics and Space Administration

Environmental Cost Estimating Tools

- Environmental Cost Element Structure (ECES)
  - A model for a project-specific (WBS) and track environmental project cost (LCC/Cost & Schedule). POC: Bryan Skokan (DOE)
- Remedial Action Cost Engineering Requirements (RACER)
  - A parametric cost modeling system based on generic engineering solutions for environmental projects. POC: Stuart Millard (Air Force)
- Cost Risk
  - COSTRISK software is designed to work with Tri-service estimating programs using Monte Carlo simulation techniques to apply contingencies. POC: Jim Nichols (USACE/HNC)
- Micro-Computer Aided Cost Estimating System (MCACES/M2)
  - A multi-user software program for detail construction cost estimates. POC: Jim Nichols (USACE).
- Cost-to-Complete System
  - A planning, programming, and budgeting system that supports financial statement liabilities. POC: Robert Sadorra (Naval Facilities Engineering Command)
- IDEAL Estimating System
  - A commercial parametric software used by NASA (In lieu of RACER) central library to store and share estimates and models . POC: Chris Hart (NASA)

TYPICAL AGENDA ITEMS

- RACER progress and issues.
- RACER Training Schedules.
- MII Cost Book.
- Area Cost Factors.
- Cost Risk Software.
- ECAS Historical Database.
- Sales Tax Waivers for Federal Remediation Projects.
- Cost savings Ideas.
- Lessons Learned.
- Agency Environmental Liability Issues.
- FRTR-EC2 Website.

CX Typical Discussion Items

- RACER Progress and Issues
  - 2008 RACER Updates
    - (11) Enhancements
    - (7) Revised Models
    - (3) New Models
    - (6) Re-Engineered Models
    - (4) Functionality Enhancements
- Richard Stricker **Phone: (402) 697-2575 E-Mail: Richard.A.Stricker@nwd02.usace.ary.mil**

CX Typical Discussion Items

- RACER Progress and Issues
  - RACER Assemblies - MII
    - Approximately 6,000 Total Assemblies
    - Approximately 3,500 converted in 2005
    - Approximately 1,800 converted in 2006
    - Approximately 700 converted in 2007-2008
- Richard Stricker **Phone: (402) 697-2575** **E-Mail: Richard.A.Stricker@nwd02.usace.ary.mil**

CX Typical Discussion Items

- Area Cost Factors (ACF)
  - RACER currently uses location modifiers for Material, Labor and Equipment Indexes (MLEI) based on a market basket of goods reflecting general vertical construction.
  - Currently efforts are underway to re-price an existing 2001 environmental market basket of goods to be incorporated into RACER.
  - POC: Rick Osborn

    Phone: (402) 697-2426

    E-Mail: Rick.L.Osborn@nwod02.usace.army.mil

Sales Tax Waivers

- Sales Tax Waivers for Federal Remediation Projects
- Table available depicting current tax exempt status.
- Status of pursuing further State Waivers is on hold.
- POC: Ken Skahn (EPA)

  Phone: (703) 602-8801

  E-Mail: skahn.ken@epa.gov

State Sales Tax Table

State	Exempt	Special Requirements	State Revenue Website
Alabama	No		http://www.ador.state.al.us/
Alaska	n/a	No state sales tax	http://www.revenue.state.ak.us/
Arizona	No		http://www.revenue.state.az.us/
Arkansas	Yes	Contractor makes all purchases as "sales for resale".	http://www.state.ar.us/dfa/
California	No		http://www.boe.ca.gov/
Colorado	Yes	Contractor must submit form DR 0172 "Contractor's Application for Exemption Certificate".	http://www.revenue.state.co.us/main/home.asp
Connecticut	Yes	Must issue CERT-134 Sales and Use Tax Exemption form to the contractor.	http://www.ct.gov/drs/site/default.asp
Delaware	n/a	No state sales tax	http://www.state.de.us/revenue/

EPA/USACE:CX COMBINED EFFORT

- COST SAVINGS EFFORTS
- LESSONS LEARNED
- VALUE ENGINEERING
- DESIGN DETAILS
- POLICY AND GUIDANCE
- WEB: Environmental Community of Practice https://eko.usace.army.mil/usacecop/pub/ecop/what_we_do/superfund/program_policy_guidance_and_activities/
- CX POC: Lindsey Lien Phone: (402) 697-2580 E-Mail: Lindsey.K.Lien@nwd02.usace.army.mil
- EPA POC: Ken Skahn Phone: (703) 602-8801 E-Mail: skahn.ken@epa.gov

ECAS Historical Data

- Environmental Cost Analysis System (ECAS).
- A database of completed DOE Environmental Management Projects (Such as Rocky Flats Projects).
- Restricted access (obtain access by POC @ web site below).
- ECAS was developed to store and report data using the Environmental Cost Element Structure (ECES) structure.
- http://ecas.apps.em.doe.gov/
- POC: Bryan Skokan (DOE)

Phone: (301) 903-7612 E-Mail: Bryan.Skokan@em.doe.gov

Agency Environmental Liability Issues

- Reporting Environmental Liabilities as Required by the Chief Financial Officer's (CFO) Act of 1990.
- Change Management Plan: This plan is designed to ensure Cost-to-Complete (CTC) is in compliance with the 1990 CFO Act.
- Quality Management Plan: This plan provides guidance on the processes to be used to assure quality in the continued maintenance and development of RACER models and software to support federal government agencies. This plan is an attachment to the RACER Business Management Plan.
- Business Management Plan: This Plan defines the business practices, requisite management controls, and other programs required to improve and maintain the integrity of the RACER cost estimates used in the recognition of environmental liabilities.
- **GUIDANCE FOR VERIFICATION AND VALIDATION (V&V) OF REMEDIAL COST ENGINEERING AND REQUIREMENTS SOFTWARE:**

  The purpose of this guidance is to ensure that parametric cost estimating systems are verified, validated and accredited in accordance with the requirements specified in Department of Defense Instruction (DoDI) 5000.61, "DoD Modeling and Simulation (M&S) Verification, Validation and Accreditation" (29 April 1996).
- POC: Hopeton Brown U.S. Army Environmental Center

Phone: (410) 436-1619 E-Mail: hopeton.brown@aec.apgea.army.mil

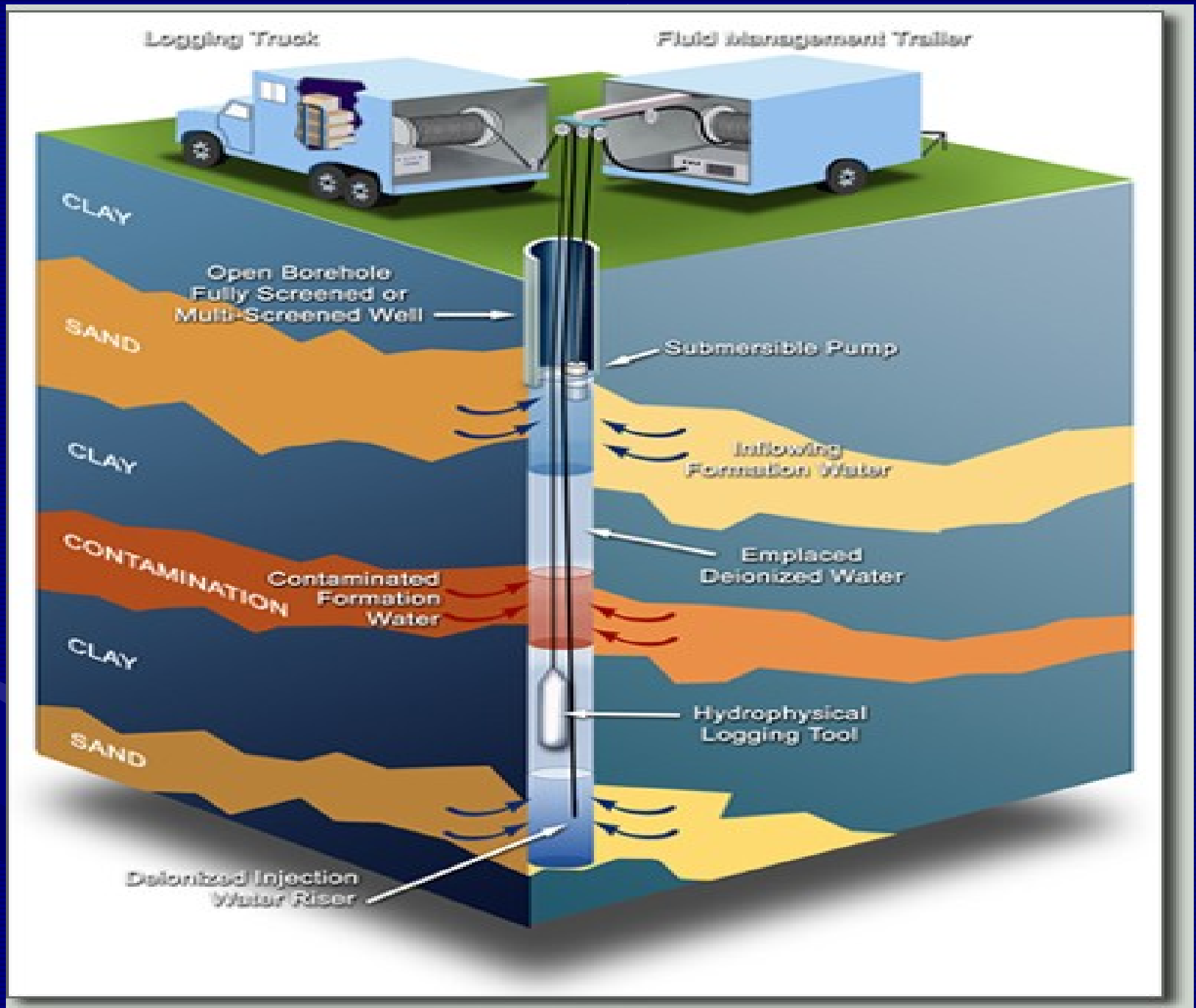
HTRW PROJECT EXAMPLES

Innovative Geophysical Technique Helps Characterize Bedrock at Glenburn and Bucks Harbor, Maine Sites

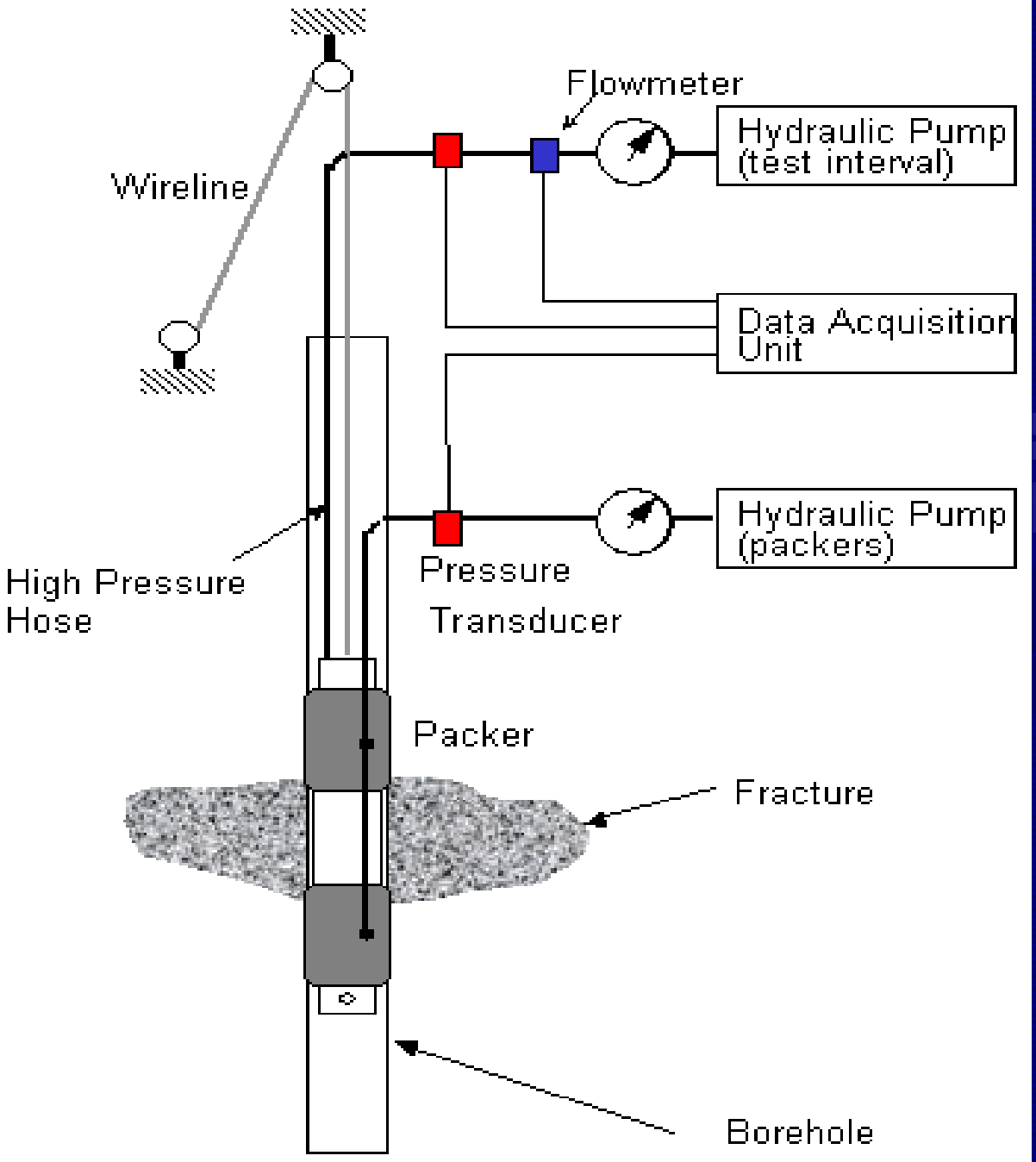
- During the 1950s and 1960s U.S. DOD was responsible for protecting the east coast from Communist missile invasion.
- Highly specialized radar systems were used and were susceptible to oxidation and corrosion.
- Components and equipment exposed to this damp environment were treated with oils for protection causing electrical shorts.
- Trichloroethylene (TCE) was used to clean electrical parts as well as a defoliant.
- The result at these Formerly Used Defense Site (FUDS) have TCE contamination in the Bedrock aquifers.
- The geology of this area is generally fractured rock with a thin overburden layer.
- Hydrophysical flow measuring techniques were incorporated to further define the fracture flow zones which allowed vertical and horizontal measure of groundwater flows within one-hundredth of a gallon per minute at near real time.
- Advanced wireline straddle packer testes were used to further define the vertical extent and interval-specific evaluation of contaminated groundwater.
- Due to the success of the hydrophysical methods employed at the site, the nature and extent of contamination was defined with a confidence level that allows treatment options to be explored in the Feasibility Study.
- COST: Bucks Harbor: $75,588
  Glenburn: $43,314
- POC: Sam Bass Phone: (402) 697-2654 E-Mail: don.b.bass@nwd02.usace.army.mil

Performing Hydrophysical Logging at

COLOG: Advanced GeoPhysical and HydroPhysical Logging Services (Layne Water



Wireline Straddle Packer System (Haimson and Lee, 1984)



Removal of Cesium-137 Contamination from the John B. LaGarde Interpretive Park

Birmingham and Atlanta.

- Fort McClellan, the former U.S. Army Chemical School conducted radiation survey training during the 1950's in a crude laboratory building.
- Laboratory was used to prepare training sources of Cobalt-60 and Cesium-137.
- In 1971 the site was cleared for surface military use.
- In 1974, 185 Ares of Fort McClellan was deeded to the City of Anniston, AL as a public park (John B. LaGarde Interpretive Park).
- In 1995 BRAC voted to permanently close Fort McClellan
- In 2001 aerial radiation surveys were conducted locating a hot spot (Cs-137) within LaGarde Park (HTRW CX called in to assist with a Site Inspection).
- Further investigation concluded that this radioactive contamination was not from training exercises but corresponded to the former laboratory waste not addressed in the 1971 Remedial Action.
- In 2005, 174 CY of contaminated soil/debris were removed/disposed of off-site at an appropriate disposal facility.
- The major challenge was the gaps in site history but with professional judgment and close coordination facilitated a successful site close-out.
- 2005: Contracts and In-house costs $640,000

Time/Distance/Shielding

BUCKLEY FIELD (AKA LOWRY BOMBING AND GUNNERY RANGE)

- Project location: Arapahoe County, Colorado
- Project Description: The Area of Concern (AOC) is a FUDS property and the response action was for Munitions and Explosives of Concern (MEC) at a Bombing Target.
- Contracting Method/Cost: This was a Fixed Price Remediation with Insurance (FPRI) (Performance Based) at approximately $4.8 million (field work completed in less than one year).
- Project Scope:
  - Geophysical Investigation to determine MEC locations
  - Excavation and removal on 628 acres
  - Characterization of an additional 98 acres
  - Disposal
  - Verification
  - Site Restoration
- Project Results:
  - 260 MEC items found and destroyed
  - 67,720 pounds of Munitions Debris destroyed and disposed
  - 99% confidence level that 99.5% or more of the site has no unexploded ordnance (UXO) remaining
- POC: Robert Dworkin Phone: (402) 697-2517
  E-Mail: Robert.J.Dworkin@nwo02.usace.army.mil

Helicopter magnetometer survey

Geo-physical investigation

M 38 Found During Transect Investigation

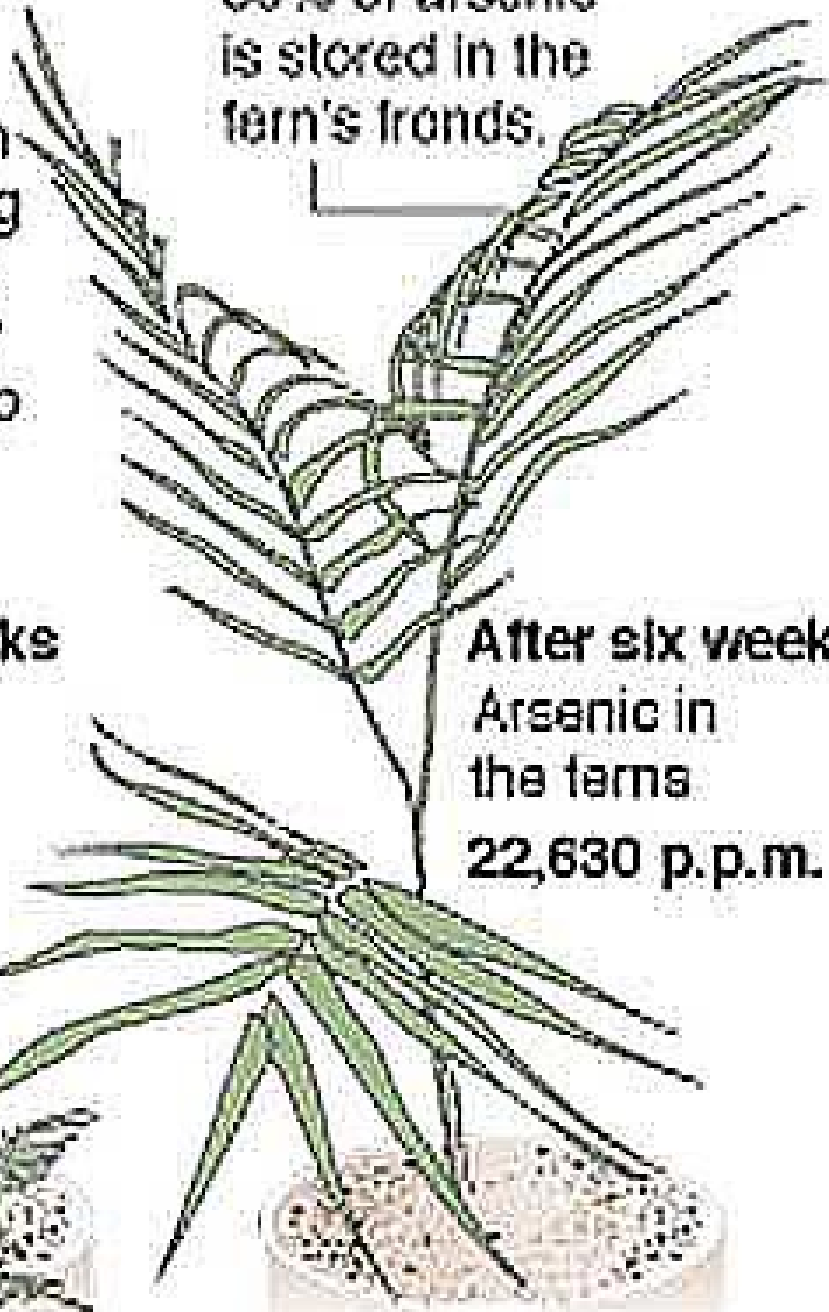
Munitions Debris

Phytoremediation Provides Spring Valley Residents an Alternative to Dig-and-Haul

- The Spring Valley FUDS Site (Located on the west side of Washington D.C.) is the former location of the American University Experiment Station (AUES).
- During World War I the Army used (AUES) to develop and test warfare agents of which Arsenic was the main constituent.
- In 2001, 140 residential properties were identified with arsenic.
- In 2004 brake ferns were utilized to extract arsenic from the soil.
- The 2005 test results were consistent and adequate to reduce arsenic levels.
- Phytoremediation offers a low-impact and roughly one-third the cost of excavation (Cost savings subject to number of plantings).
- POC: Sam Bass Phone: (402) 697-2654
E-Mail: don.b.bass@nwd02.usace.army.mil

Fern will detoxify soil

The latest issue of the journal Nature reports the discovery of a fern that can rapidly absorb arsenic from surrounding soil. The carcinogenic and highly toxic contaminant is widespread. The hardy fern, Pteris vittata, could provide a cheap and effective way of cleaning contaminated sites.



Start
Arsenic in the ferns
0 parts per million (p.p.m.)

After two weeks
Arsenic in the ferns
15,861 p.p.m.

After six weeks
Arsenic in the ferns
22,630 p.p.m.

KEARNEY RIFLE RANGE AND WAVERLY AFS BD/DR PROJECTS

- Project Locations: Kearney, NE and Waverly, IA
- Project Description: These Building Demolition and Debris Removal (BD/DR) projects on FUDS properties.
- Scope of work::
  - Kearney Rifle Range: Dismantling of three Firing Berms.
  - Waverly AFS: Removal of one building from a recreational area.
  - Site Restoration of both Sites.
- Cost:
  - Kearney Rifle Range: $290,000
  - Waverly AFS: $140,000
- POC: Robert Dworkin Phone: (402) 697-2517

E-Mail: Robert.J.Dworkin@nwo02.usace.army.mil

Kearney Rifle Range Prior to field

Kearney Rifle Range Target Berm with Debris

Mechanical Screening at the Kearney Rifle Range

Kearney Rifle Range Site

Former Forbes Atlas Missile Site S-6

- This is a FUDS property located near Keene Kansas.
- Site S-6 is one of nine Atlas E Missile silos associated with the Former Forbes Air Force Base Missile Complex, Topeka Kansas.
- The Atlas E missiles were designed in the 40's, operated in the late 50's and all decommissioned by 1965. Forbes AFB was finally closed in 1973 and the sites were sold.
- This clean-up contract (2004-2005) was for solvent contamination, specifically trichloroethylene (TCE), vinyl chloride, that were present in sediment, sludge and groundwater from former DOD activities.
- The removal action was for contaminated sludge and sediments from the site's flame pit, sump system and sediment trap, as well as groundwater sampling over a period of years.
- This removal action prevented further groundwater contamination.
- This is a 28 acres site and the as a private residence for the current landowner.
- The Landowner/Resident was connected to rural water to prevent any future health risks and the Kansas Department of Health (KDHE) concurred with site close out.
- Site S6 was combined with site S7 to remove 26 tons of sediments and debris characterized as hazardous and disposed of at Clean Harbors Lone Mountain landfill in Oklahoma. 6 tons of non-hazardous waste disposed of at Waste Management rolling Meadows landfill in Kansas. 87,060 gallons of water generated during removal action processed through a Granular-Activated Carbon (GAC) unit, then transported to the City of Topeka water treatment facility.
- The cost of this combined effort was $250,000.
- POC: Saqib Khan Phone: (816) 389-3239

E-Mail: saqib.khan@nwk02.usace.army.mil

Typical Missile Site

1950's Photo in Topeka Kansas

Photo as a Privately Owned

Setting up for work in the Main Sump.

Inside the Main Sump prior to cleaning (first level) (4/16/2004).

Small sump after cleaning and sampling (4/15/2004)

Common Operations Reports (CORs)

- The U.S. Army Corps of Engineers (USACE) as the executing agency for the Formerly Used Defense Sites (FUDS) developed Common Operations Reports (CORs) to provide factual information on common military and support service operations.
- These reports are based on historical military manuals, provide factual information, eliminate duplication of effort in turn reduce costs for Preliminary Assessments and other Environmental Documents.
- CORs:
  - Describe and document the practices associated with operations.
  - Identify the categories of munitions, chemicals and related materials associated with those operations.
  - Focus on practices with the potential for releases to the environment.
  - Address the changes in practices and materials used over time.
  - Cite the historical documents such as field and technical manuals from which the information is derived.
- Stan Bauer **Phone: (402) 697-2619 E-Mail: Stanley.d.bauer@nwd02.usace.ary.mil**
- CORs: For Official Use Only (FOUO) status

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THE END

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